Certified Python Course – Curriculum

The Certified Python course by DataFlair is a perfect blend of in-depth theoretical knowledge and strong practical skills via implementation of real life projects to give you a headstart and enable you to bag top Data Science and other Python jobs in the industry.

Course duration: 40 Hours

Module 1: Introduction

This module introduces you to the rudiments of Python, what makes it so massively popular, and its benefits and limitations. It also compares Python with other languages like Java, Scala, and R.

- Introduction to Python
- Python Environment Setup
- Features of Python
- Basic Python Syntax
    - Statements, Indentation, and Comments
- 7 Reasons to Learn Python
- Benefits and Limitations of Python
- A Career in Python
- Python vs Java
- Python vs Scala
- Python vs R
- Applications of Python
- Compilers and Interpreters Available
- Getting to Know the Python Interpreter

Module 2: Basics

We then introduce you to the basics of Python- variables, data types, and operators. We also discuss concepts like looping and decision making.

- Python Variables
    - Python Variable Scope
- Data Types in Python
- Python Operators
    - Bitwise Operators
    - Comparison Operators
    - Operator Precedence
    - Ternary Operators
- Python Decision Making
    - Switch-case in Python

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- Loops in Python
- Numbers with Python
- Python Strings
    - String Formatters and Escape Sequences
    - String Functions and Operations
    - The repr() Function

Module 3: Data Structures

This module deals with containers like lists and tuples. It also teaches you the operations performed on them. You will also learn about other containers like dictionaries and sets.

- Python Lists
    - List Comprehension
    - The array Module
- Python Tuples
    - The zip() Function
    - Tuples vs Lists
- Slicing in Python
- Binary Sequence Types- bytes, bytearray, memoryview
- Dictionaries in Python
- Sets in Python
- Booleans in Python

Module 4: Functional Programming

Next, we discuss functional programming with concepts like function arguments and lambda expressions. We also take a good look at some important built-in functions. Finally, we discuss decorators, closure, and itertools.

- Functions in Python
- Lambda Expressions
- Function Arguments
- Function Recursion
- Built-in Functions
    - range()
    - eval()
    - exec()
- Decorators in Python
- Closure in Python
- Working with itertools

Module 5: Modules and Packages

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After finishing this module, you will be comfortable with modules and creating them. We will discuss multiple important ones, and will then move on to packages. Finally, we will compare the two.

- Modules
    - Counter
    - Defaultdict
    - OrderedDict
    - namedtuple
    - Numeric Modules- math, decimal, random
    - sys
    - Generating Random Numbers
- Packages
    - pip and PyPI
    - Modules vs Packages

Module 6: Miscellany

Time to dig deeper into Python! This module takes you to more advanced concepts like regular expressions, date and time, and debugging.

- Regular Expressions with Python
- Multithreading in Python
- Working with Date and Time
- Namespace and Scope
- Virtual Environments and Packages
- The datetime Module - Part I
- The datetime Module - Part II
- The calendar Module
- The Python Debugger (pdb)
- CGI Programming with Python
- Understanding urllib
- Terminologies in Python
- What's new in Python 3.7?
- Deep Copy vs Shallow Copy
- Assert Statements in Python
- Pretty-Printing with pprint

Module 7: Object-Oriented Programming

We now begin talking object-oriented programming. We talk of classes, methods, and objects. Then, we try a hand at inheritance and operator overloading. Finally, we discuss concepts like generators, iterators, and property.

- Methods in Python

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    - Methods vs Functions
    - Magic (Dunder) Methods
- Classes in Python
- Python Objects
- Inheritance in Python
- Multiple Inheritance
- Python Operator Overloading
- Generators in Python
- Iterators in Python
    - Generators vs Iterators
- Serialization with pickle
- The property Decorator

Module 8: File Handling

Halfway through the course now, we begin to explore other concepts like file handling. This module teaches you to manipulate files with the help of the OS and shutil modules. We will also learn how to copy, rename, and zip files using Python.

- Reading and Writing Files
- Managing Directories and Files
- The OS Module
- The shutil Module
- Copying Files with Python
- Renaming Files with Python
- Zipping Files with Python

Module 9: Exception Handling

We move on to exception handling. In this module, we talk of common errors, exceptions, and unit testing.

- Errors and Exceptions
- Exception Handling
- Testing with unittest

Module 10: Important Libraries

With such powerful libraries by your side, it is possible to nurture the true power of a tool like Python.

- Python Libraries
- NumPy
- SciPy
- pandas

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- Visualizing with matplotlib
- PyQT
- PyGTK
- PyTorch
- Altair
- Web Scraping with Scrapy
- Data access mechanisms
- Spacy

Module 11: Other Functionality

Now, we discuss concepts like sending mail and accessing the database with Python. We also talk of logging and multiprocessing.

- XML Processing
- Sending Mail with Python
- Networking
- Processing Images
- GUI Programming
- Forensics
- Extensions to Python
- Tools
- Accessing the Database
- Logging with Python
- Multiprocessing

Module 12: Popular Frameworks

This module focuses on essential web frameworks like Django and Flask.

- Web Frameworks
- Django
- Flask

Module 17: Real-life Project on Python

We conclude this course with 5 real-time Python projects to prepare you for the industry. These focus on topics like computer vision and machine learning.

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